

1. **SCOPE OF WORK:** The Contractor shall provide Engineering and Technical support for Structural, Electrical, and Mechanical divisions as described in this Performance Work Statement (PWS). Full time in house contractor support is required for the development and review of Landing, Helicopter, Assault (LHA), Landing Helicopter Dock (LHD), Carrier, Vessel, Nuclear powered (CVN), Auxiliary Repair Dry Dock Medium (ARDM) and Auxiliary Floating Dry Dock, Large (AFDL) class drawings.
2. **APPLICABLE DOCUMENTS:** The following documents shall form a part of the technical requirements for work under this requirement
  1. NAVSEA T/M 9AAO-AB-GOS-010/GSO Naval General Specifications for Overhaul
  2. NAVSEA T/M 9AAO-AB-GOS-020/GSO Supplement - Naval General Specifications for Overhaul Nuclear Supplement
  3. NAVSEAINST 9210.4- Changes, Repair, and Maintenance to Nuclear Powered Ships
  4. NAVSEA T/M SL720-AA-MAN-030 – Surface Ship and Carrier Entitled Process for
  5. Modernization Management and Operations Manual

#### 2.5 I.D.E.A. CAD Standards

### 3. **REQUIREMENTS:**

#### 3.1 **GENERAL:**

3.1.1 The Contractor shall provide subject matter experts to deliver full time support for the duration of the contract to support ship checks, development of ship installation drawings for modernization ship alterations, repairs programmed for these ships, preparation of Ship Alteration Records and Justification Cost Forms. Additionally, they shall maintain Ship Selected Record Drawings and Tech Manuals, support development engineering production estimates and associated material ordering documents and support Engineering Configuration Management reviews.

3.1.2 The Contractor shall provide waterfront support to resolve technical issues identified during work execution as well as provide engineering support for habitability and Research & Development (R&D) projects to NAVSEA and other private and government activities and shipyards.

3.1.3 The government shall answer questions and resolve all problems concerning the following technical requirements, via the COR.

3.1.4 The Contract Period of Performance shall be for a base period of twelve (12) months with four (4) twelve (12) month option periods for a total of five (5) years

3.1.4.1 All option years will consist of the designated number of Contractors required as shown in chart 1 under section 3.2.

#### 3.2 **SPECIFIC WORK REQUIREMENTS:**

3.2.1 **Surface Ship Structural:** The Contractor shall provide full time engineering support to provide design services for Naval Architecture and Structural Engineering shall be provided. Particular areas of expertise shall include shock hardening, welding, hull structural systems, decks, structural bulkheads, superstructure, foundations and supportive systems, and ballistic protective systems.

3.2.2 **Surface Ship Topside/Exterior Structural:** The Contractor shall provide full time engineering support to provide design services for antenna/weapons foundations and platforms, masts, personnel safety items such as handrails, safety nets, fall arrest protection, and exterior vertical/accommodation ladders, exterior equipment

foundations, mooring fittings, aircraft securing fittings, boat davits, and equipment maintenance pad eyes. Also provides structural calculations supporting the items above including finite element analysis.

**3.2.3 General Arrangements Structural:** The Contractor shall provide full time engineering support to provide design services for General Arrangements/ Structure which includes hull outfitting, habitability and stowage. This code is responsible for all berthing, sanitary and other living spaces, all galleys, mess decks and other food service spaces, all workshops, offices, storerooms and magazines.

**3.2.4 Surface Ship Propulsion Plant Piping:** The Contractor shall provide full time engineering support to provide design services for propulsion piping surface ships.

The contractor shall be familiar to all the components associated with those systems such as heat exchangers, pumps, valves, compressors, and other complex machinery. Systems include but are not limited to; main, auxiliary, exhaust, and catapult steam; condensate; feed water; main and auxiliary cooling water; high and low pressure propulsion plant drains; distilling plant system; fuel oil service; control and catapult air; and incinerator exhaust. The contractor shall be able to perform engineering analysis, design, and evaluation of cognizant systems including thermodynamic analysis, flow and pressure loss analysis, material selection, sizing of piping, control valves and pumps, and other engineering work on piping systems and components.

**3.2.5 Surface Ship Heating/Ventilation and Air Conditioning (HVAC):** The Contractor shall provide full time engineering support to provide design services for HVAC, Collection, Holding, and Transfer (CHT), Drains and electronic cooling water systems.

**3.2.6 Auxiliaries Machinery/ Hydraulics:** The Contractor shall provide full time engineering support to provide design services for Systems including aircraft and weapons/cargo elevators, catapults (mechanical and hydraulic systems only), arresting gear and barricade, jet blast deflectors, bridle arresters, steering gear, rudders, anchor windlasses, cargo handling monorails and hoists, cranes, weapons handling (davits, monorails, hoists, skip boxes), hydraulics for Rigid-hulled Inflatable Boat (RHIB) davits, heads up display hydraulics, hydraulic piping, Replenishment at Sea (RAS) & Fueling at Sea (FAS) winches, vertical package conveyors, hangar division and deck edge doors, underwater log rod-meter hoisting mechanism, counter-weighted ballistic hatches and mooring & warping capstans. The contractor shall be familiar with engineering analysis, design, and evaluation of cognizant systems including flow and pressure loss analysis, material selection, sizing of piping, control valves and pumps, and other required engineering work on piping systems and components.

**3.2.7 Surface Ship Non-Nuclear Propulsion Piping:** The Contractor shall provide full time engineering support to provide design services for all the components of heat exchangers, pumps, valves, compressors, and other complex machinery. Systems include but are not limited to; firefighting (seawater, Aqueous Film Forming Foam (AFFF), Halon, CO<sub>2</sub>); potable water, compressed air; Oxygen Nitrogen (O<sub>2</sub>N<sub>2</sub>); aviation fuels (JP-5); ship fuel and fuel compensating; lube oil fill, transfer and purification; countermeasure wash-down; service steam; and drainage and ballasting. The contractor shall be able to support engineering analysis, design, and evaluation of cognizant systems including thermodynamic analysis, flow and pressure loss analysis, material selection, sizing of piping, control valves and pumps, and other engineering analysis.

**3.2.8 Carrier Internal Communication (IC), Weapons, and Fire Control:** The Contractor shall provide full time engineering support to provide design services for IC, Weapons, and Fire Control systems, including waterfront, preplanning, and Planning Yard services. Contractor shall be able to support the following systems: Telephone (J Dial, Integrated Voice Network (IVN)), Announcing (1MC, 3MC, 5MC), Intercom (2MC, 19MC, 22MC, 46MC), Sound Powered Telephone & E-Call, Weapons (Rolling Airframe Missile, Close In Weapon System, NATO Sea Sparrow Missile, MK38 Gun), Navigation (Navigation Sensor System Interface (NAVSSI), Ring Laser Gyro, GPS, Navigation Critical Distribution System (NAVCRIT), IC Switchboards), Machinery Control (Alarm, ADCS, ICAS, Firemain), Machinery Control Network, Monitoring and Indication, Television (Ships Entertainment, Surveillance, Launch And Recovery Television Surveillance (ILARTS)), Ship Control (Engine Order, indication and control).

**3.2.9 Surface Ship IC, Weapons, and Fire Control:** The Contractor shall provide full time engineering support to provide design services for IC, Weapons, and Fire Control systems.

Contractor shall be able to support the following systems: Telephone (J Dial, IVN), Announcing (1MC, 3MC, 5MC), Intercom (2MC, 19MC, 22MC, 46MC), Sound Powered Telephone & E-Call, Weapons (Rolling Airframe Missile, Close In Weapon System, NATO Sea Sparrow Missile, MK38 Gun), Navigation (NAVSSI, Ring Laser Gyro, GPS, NAVCRIT, IC Switchboards), Machinery Control (Alarm, Advance Damage Control System (ADCS), Intersection Collision Avoidance System (ICAS), Firemain), Machinery Control Network, Monitoring and Indication, Television (Ships Entertainment, Surveillance, ILARTS), and Ship Control (Engine Order, indication and control).

**3.2.10 Carrier C4ISR (Command, Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance):**

The Contractor shall provide Full time engineering support to provide design services for Combat Systems processing & display Ship Self-Defense System ((SSDS), Naval Tactical Data System ( NTDS), etc.), Air Search and Surface Search RADARs, Networking systems, Electronic Warfare systems (EW), Identify Friend/Foe (IFF), Intel Data Processing & Display, Shipboard Topside Configuration, Line Of Sight (LOS) and SATCOM radio systems, Tactical Data Links, Data Multiplexing, Torpedo Countermeasures, SONAR systems, Signal Exploitation, and other associated & support systems.

**3.2.11 Carrier Power, Lighting, and Controls:** The Contractor shall provide full time engineering support to provide design services for Power, Lighting and Advanced Control Systems. Contractor shall be able to support the following systems: 60 Hz and 400 Hz Shipboard Electrical Distribution, Electrical Machinery Control, Ventilation Control, Fire Fighting Control (AFFF and Firemain), Degaussing, Cathodic Protection, Weapons and Aircraft Elevator Control, Receptacle Distribution, and Lighting Distribution. Contractor shall be required to perform analyses of the electrical power distribution system and recommend upgrades to support modernization, perform space lighting surveys and accomplish navigational light surveys.

**3.2.12 Surface Ship Power, Lighting, and Controls:** The Contractor shall provide full time engineering support to provide design services for 60 Hz and 400 Hz shipboard electrical distribution systems, electrical machinery control systems and lighting systems.

Contractor shall be required to perform analyses of the electrical power distribution system and recommend upgrades to support growth in ship's electrical loads, performing shipboard lighting surveys and writing navigational light reports.

CODE	BRANCH	BASE	Option Year 1	Option Year 2	Option Year 3	Option Year 4	Option to Extend
251 Ref: 3.2.1	Surface Ship Structural	11	11	11	11	11	11
252 Ref: 3.2.2	Surface Ship Topside/Exterior Structural	7	7	7	7	7	7

254 Ref: 3.2.3	General Arrangements Manager	12	12	12	12	12	12
261 Ref: 3.2.4	Propulsion Plant Piping	1	1	1	1	1	1
262 Ref: 3.2.5	HVAC PY	3	3	3	3	3	3
263 Ref: 3.2.6	Surface Ship Mechanical	1	1	1	1	1	1
267 Ref: 3.2.7	Surface Ship Non- Nuclear Propulsion Piping Planning	4	4	4	4	4	4
271 Ref: 3.2.8	Carrier IC, Weapons, and Fire Control	3	3	3	3	3	3
272 Ref: 3.2.9	Surface Ship IC, Weapons, and Fire Control	2	2	2	2	2	2
273/274 Ref: 3.2.10	Carrier C4ISR	3	3	3	3	3	3
276 Ref: 3.2.11	Carrier Power, Lighting, and Controls	4	4	4	4	4	4
277 Ref: 3.2.12	Surface Ship Power, Lighting, and Controls	1	1	1	1	1	1
	Totals Required Support	52	52	52	52	52	52

CHART 1 (TOTAL PERSONNEL)

\*THE CONTRACTOR SHALL PROPOSE ON THE AMOUNT OF PERSONNEL REQUIRED ON THIS TASK\*

### 3.3 SPECIAL REQUIREMENTS:

3.3.1 The Contractor shall be proficient with AutoCAD for drawing development

- 3.3.2 The Contractor shall be proficient in writing interoffice correspondence (memos, letter, and reports)
- 3.3.3 The Contractor shall be familiar with shipyard, local and NAVSEA processes and instructions
- 3.3.4 The Contractor shall have knowledge of material ordering from Navy Stock System using mil-spec ordering data
- 3.3.5 The Contractor shall be familiar with Steam Plant Cleanliness per NAVSEAINST 9210.36 applicable to Codes 261 and 267
- 3.3.6 The Contractor shall be familiar with Level I per NAVSEA T/M 0948-LP-045-7010 Material Control Standard Non- nuclear.
- 3.3.7 The Contractor shall have knowledge of commercial specifications (ANSI, ASTM, AISI) and Military Specifications.
- 3.3.8 The Contractor shall be familiar with NSTM CHAPTER 096 and CHAPTER 997, applicable to Codes 251, 252 and 254.
- 3.3.9 The Contractor shall read and interpret ship alteration (SHIPALT) proposals and SHIPALT records.
- 3.3.10 The Contractor shall read and interpret Ships Installation Drawings (SID).
- 3.3.11 The Contractor shall be Familiar with Autodesk suite and AutoCAD software for drawing development.
- 3.3.12 The Contractor shall be capable of board checking drawings with a high level of expertise and accuracy.
- 3.3.13 The Contractor shall be capable of conducting Finite Element Analysis (FEA) to verify modifications to ship are accurate, applicable to Codes 251 and 252.
- 3.3.14 Contractor shall develop from cradle to grave engineering drawings using CAD software.
- 3.3.15 Drawing must be technically complete and accurate and shall be ready for issue with minimum Government review.
- 3.3.16 Contractor shall develop and or review drawings that conform to I.D.E.A CAD Standards.
- 3.3.17 Contractor shall develop and or review drawings to conform to Intelligent Ship Installation Drawing AUTOCAD Module template latest version.
- 3.3.18 Contractor shall develop and or review drawings in accordance with GSO requirements.
- 3.3.19 Contractor shall develop and or review drawings in accordance with NSTM requirements.
- 3.3.20 Contractor shall develop and or verify the accuracy of drawings in accordance with NAVSHIPYD Norfolk requirements.
- 3.3.21 Contractor shall develop and or review drawings that completely and efficiently accomplish the intent of the applicable Ship Alteration Request (SAR) / Ship Change Document (SCD).
- 3.3.22 Contractor shall conduct engineering investigations, including ship checking and system troubleshooting, in order to obtain data for use in develop drawings, engineering reports and test procedures.

3.3.23 Contractor shall develop and or review drawings that include required Weight and Moment requirements.

3.3.24 Contractor shall develop and or review drawings that adequately address shock requirements.

3.3.25 Contractor shall develop and or review drawings that include required safety and/or environmental considerations.

3.3.26 Contractor shall develop and or review drawings that accurately depict arrangement of equipment location and clearance requirements of equipment, furnishings and interferences.

3.3.27 Contractor shall interface between different technical disciplines to ensure complete integration of various systems.

3.3.28 Contractor is responsible for all engineering calculations associated with drawings.

3.3.29 Contractor shall develop and or review drawings that adequately identify system and component test requirements.

3.3.30 Contractor shall develop and or review drawings and they shall be logically organized.

3.3.31 Contractor personnel shall identify themselves as “contractors” when attending meetings, answering telephones, or working in situations where their actions could be construed as official government acts.

3.3.32 Contractor must be able to perform Ship checks for, the development of all Entitled Process (EP) products, shall be in sufficient detail that complete design information will be made available on the plans for the shipboard interface between existing conditions and the new installation or alteration.

3.3.33 Contractor shall submit a Personnel Roster (CDRL A002)

3.3.34 The contractor will be required to provide written documentation showing that the non-key personnel, provided in accordance with the Technical Instruction tasking, has the technical capability to perform the requirements of the Technical Instruction. The written documentation must provide a description of the level and length of experience of the proposed non-key personnel.

**3.4 KEY PERSONNEL MINIMUM QUALIFICATIONS:** The Contractor shall provide:

Key Personnel are deemed essential to the performance of this effort and cannot be replaced without prior notice to the Government (**IAW clause 5252.237-9106, SUBSTITUTION OF PERSONNEL**).

**3.4.1 A SENIOR ENGINEER OR NAVAL ARCHITECT (MECHANICAL, STRUCTURAL, AND ELECTRICAL):**

3.4.1.1 Must have a Professional Engineer's License, (as appropriate to assigned cognizance), or

3.4.1.2 A Bachelor's degree in Engineering or Naval Architecture (as appropriate to assigned cognizance)

3.4.1.2 A minimum of ten (10) years practical design engineering experience, at a professional level, in responsible engineering duties, including the following which may have been gained concurrently.

3.4.1.2.1 Minimum of four (4) years progressive design experience (within last seven (7) years) involving design and working plan development for construction, conversion or modernization of U.S. Naval Ships (does not include maritime ship design) in the specialty required herein.

3.4.1.2.1 A degree in Engineering Technology is not considered equivalent to the required Bachelor of Engineering Degree.

#### 3.4.2. SENIOR ENGINEERING TECHNICIAN:

3.4.2.1 Academic Requirements: All personnel in this group must be graduates of a high school, trade, or industrial school, or correspondence school where, as a minimum, credits were received in all of the following: algebra, plane geometry, trigonometry, drafting, and physics.

3.4.2.2 Specialized Experience Requirements (in area of assigned cognizance): Creditable experience includes:

3.4.2.2.1 Minimum of fifteen (15) years practical design engineering experience, at a professional level, in responsible engineering duties, including the following which may have been gained concurrently.

3.4.2.2.3 Minimum of ten (10) years progressive design experience (within last fifteen (15) years) involving design and working plan development for construction, conversion or modernization of U.S. Naval Ships (does not include maritime ship design) in the specialty required herein.

#### **4. CONTRACT SECURITY AND ACCESS REQUIREMENTS:**

4.1 All references and deliverable items associated with this task are confidential and listed below. Contractor employees must be U.S. citizens and shall have a confidential clearance to obtain a Shipyard badge and Common Access Card (CAC) for unescorted entry to Norfolk Naval Shipyard, and access to the Shipyard computer network and Navy/Marine Corps Intranet (NMCI). Security Clearance information shall be submitted with contractor proposal. There are no other known requirements for access to restricted areas or information connected with the performance of this task.

#### **5. GOVERNMENT FURNISHED PROPERTY (GFP):**

5.1 The COR will provide the required all other Government Furnished Property (GFP) (i.e., workstation, chair, desk, printer, and miscellaneous consumables necessary to accomplish this task) at the start of the period of performance. All Government Furnished Property (GFP) shall be returned to the government Technical Lead (TL) upon completion of the task. All documents and products developed are the property of the government.

#### **6. QUALITY ASSURANCE:**

6.1 Work standards, warranties and quality program requirements are specified in the basic contract previously provided to the contractor. All other GFP shall be provided in time to support contractor performance of the work.

#### **7. ADDITIONAL INFORMATION:**

7.1 Personnel supporting this in-house task will work at NNSY, Monday through Friday during normal shipyard hours (7:20 AM till 3:50 PM). Any deviation from these hours must be agreed upon in writing between the Contractor and the Contracting Officer Representative (COR). Personnel supporting this requirement must provide required applications for badges (i.e., CAC, unescorted NNSY Island of Security access and obtain NMCI account) on the day of award. The contractor shall submit a Man-Hours Expenditure Report (CDRL A001). The contractor shall provide the necessary level of support to successfully accomplish all requirements set forth within this PWS. All contractor personnel must possess the necessary qualifications, skills, background, and expertise as specified within this PWS.

1. Task Order Management Plan is not required.
2. Disciplines need to be covered for the duration of this requirement.

3. Resumes are required under this task. (The Government shall not evaluate contractors' offers which contain contingencies such as the hiring or movement of existing personnel from a previously awarded task order.
4. All resume submitted MUST be for key personnel employed by the company at the start of the period of performance (POP) (no exceptions). All resumes for replacements must be forwarded to NNSY Code 410 for approval. Approved replacements must be currently employed by the company and have the same rate and labor category as the person submitted in the RFQ. If a security clearance is required, it must be granted prior to submitting replacement resume.
5. Team leaders will be identified at the issuance of tasks.
6. Twenty percent (20 %) of overtime is authorized with COR approval.
7. Travel in accordance with the Joint Travel Regulations (JTR) and clauses of the basic contract apply.
8. No Contractor Disk will be provided.
9. Additional data is not available on disc.
10. Contractor personnel working under this task who are absent from the worksite in excess of 16 consecutive man-hours (2 days) shall be replaced by contractor personnel possessing the same job skills including appropriate clearances and badges. During times of inclement weather conditions, or other situations that affect NNSY operations, the contractor, unless designated in the task order, is considered non-essential personnel and will follow the shipyard policy of reporting to work by checking NNSY information phone line (b)(6).
11. All required reports shall be completed by the on-site full time contractor support utilizing government furnished equipment. No additional reports from the contractor office will be required outside of the requirement of the basic contract.

7.12 The Contractor shall submit a Contract Invoicing and Payment Report (CDRL A003).

## **8. PERFORMANCE REQUIREMENT SUMMARY:**

### **CPARs scale:**

<b>Primary Performance Objectives</b>	<b>Performance Standard/AQL</b>	<b>Performance Assessment Method</b>
Contractor met the performance requirements of each individual Technical Instruction (T.I.).	100% of drawings were completed with Zero errors  AQL: 100% of drawings were completed with 4 or fewer errors each	-Review by government technical personnel  -Random spot checks of work prior to completion dates  -Gov't will assess this on a T.I. by T.I. basis and assess overall performance on annual CPARS.
The Contractor was able to meet the scope requirements.	100% of all requirements completed on time  AQL: 90% of requirements completed on time	-Review by government technical personnel  -Random spot checks of work prior to completion dates  -Gov't will assess this based on the types of tasking on annual CPARS.
The Contractor maintained close liaison and good communications with the Government including adequate notice when guidance or technical problems/conflicts arose.	100% of notifications and communications were received in compliance with the contract  AQL: No more than 5% of reports/communications may be later than	-Review weekly reports/logs  -Gov't will assess this on a T.I. by T.I. basis and assess overall compliance at annual CPARS review.



	the time specified and/or 5% of required situations left unreported	
Invoices submitted did not list charges without including the applicable receipt.	<p>100% of invoices reflect accurate charges with supporting documentation</p> <p>AQL: No more than 5% of charges have lost/missing supporting documentation</p>	<p>-Review of all invoices/supporting documentations</p> <p>-Review of weekly hours' database</p> <p>-Gov't will track in database and assess periodically, with formal assessment on annual CPARS.</p>
CDRLs were submitted in a timely manner.	<p>100% of CDRLs are submitted in compliance with the contract</p> <p>AQL: No more than 5% were submitted later than specified</p>	<p>-Track and log the submission for comparison to the contract required dates</p> <p>-Gov't will assess periodically, with formal assessment on annual CPARS</p>
The Contractor was effective in controlling costs.	<p>Contractor stayed at or under contract award amount</p> <p>AQL: No more than 5% growth</p>	<p>-Track invoices</p> <p>-Review of weekly reports</p> <p>-Gov't will assess this on a T.I. by T.I. basis and assess overall compliance at annual CPARS review.</p>
The Contractor complied with the guidance and requirements.	<p>100% of guidance and requirements were followed</p> <p>AQL: Less than 5% of the time guidance was not followed as specified in contract</p>	<p>-Review by government/technical personnel</p> <p>-Random spot checks prior to completion dates</p> <p>-Gov't will assess this on a T.I. by T.I. basis and assess overall compliance at annual CPARS review.</p>
The Contractor was able to provide skilled personnel in each labor category when required.	<p>100% of resumes presented are accepted and all positions are filled within two weeks of vacancy</p> <p>AQL: 90% of resumes are presented and all positions are filled within one month of vacancy</p>	<p>-Review by government/technical personnel</p> <p>-Gov't will assess this on a T.I. by T.I. basis and assess overall compliance at annual CPARS review.</p>
The Contractor controlled employee Shipyard badges when employee was not actively employed on this contract's work.	<p>100% of badges were turned over to the COR within 1 week of termination</p> <p>AQL: 100% of badges were turned over to the COR within 2 weeks of termination</p>	<p>-Review of files/logs by COR</p> <p>-Gov't will assess this on a T.I. by T.I. basis and assess overall compliance at annual CPARS review.</p>
The Contractor maintained close liaison and good communications between various technical disciplines within their organizations.	<p>100% of notifications and communications were received in compliance with the contract</p> <p>AQL: No more than 5% of reports/communications may be later than the time specified and/or 5% of required situations left unreported</p>	<p>-Review weekly reports/logs</p> <p>-Gov't will assess this on a T.I. by T.I. basis and assess overall compliance at annual CPARS review</p>

Contractor's deliverables were "ready for issue"	100% of deliverables were ready for issue as specified in the contract  AQL: No more than 5% of deliverables required correction and/or were received late	-Review by government/technical personnel  -Random spot checks prior to issue date  -Gov't will assess periodically, with formal assessment on annual CPARS
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9. **TECHNICAL/ADMINISTRATIVE POINTS OF CONTACT:**

Name	Title	Location	Code	Phone
(b)(6)	(b)(6)	(b)(6)	(b)(6)	(b)(6)

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